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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,993	04/21/2004	Harold Alexis Huggins	HUGGINS 7	5503

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EXAMINER	
LIE, ANGELA M	

ART UNIT	PAPER NUMBER
2163	

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/828,993	HUGGINS, HAROLD ALEXIS	
	Examiner	Art Unit	
	Angela M. Lie	2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29,34 and 35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29,34 and 35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krishaswamy et al (US Patent 5853601). Krishaswany discloses a radio frequency (RF) component comprising: a dielectric layer (Figure 5F below, element 103) having opposing first and second major surfaces, the first surface being free from a semiconductor substrate (semiconductor is etched away, leaving air gap behind), the dielectric layer having a plurality of openings (Figure 5F below, element 113) extending between the first and second opposing major surfaces; and a patterned conductive layer (Figure 5F below, elements 105 and 109) on the second major surface of the dielectric layer (Figure 5F, element 103), wherein the plurality of openings (Figure 5F, elements 113) are on opposing sides (as shown in the figure below) of the patterned conductive layer (Figure 5F, element 109) and through the RF component at least to the semiconductor substrate (Figure 5F, element 101), and the openings to having a diameter in a range of about .5 to 20 um (column 6, lines 44-46, since the thickness of dielectric (Figure 5D, element 103) is about 1 um, just by looking at the ratios or proportions of the elements in respect to each other, one can clearly see that diameter

of the opening is approximately 2-3 microns). Krishaswamy discloses the claimed invention except for substantially uniform spacing being in a range of about 20 to about 200 microns. It would have been an obvious matter of design choice to change the spacing length from 10 microns as taught by Krishaswamy (ratio relation from the drawings) to about 20 to 200 microns, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955). Furthermore the other important thing to note is the fact that the spacing between the openings does not change the functionality of the device. The only limiting factor in making the spacing very large, is the etching process, i.e. if spacing is too large it might be very hard to etch Silicon substrate completely under the dielectric layer.

3. Claim 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krishaswamy et al (US Patent 5853601) in the view of Fjelstad (US Patent 4482445).

As to claim 34, Krishaswamy teaches a radio frequency (RF) component comprising: a dielectric layer (Figure 5F below, element 103) having opposing first and second major surfaces, the first surface being free from a semiconductor substrate (semiconductor is etched away, leaving air gap behind), the dielectric layer.having a plurality of openings (Figure 5F below, element 113) extending between the first and second opposing major surfaces; and a patterned conductive layer (Figure 5F below, elements 105 and 109) on the second major surface of the dielectric layer (Figure 5F, element 103), wherein the plurality of openings (Figure 5F, elements 113) are on opposing sides (as shown in the figure below) of the patterned conductive layer (Figure

5F, element 109) and through the RF component at least to the semiconductor substrate (Figure 5F, element 101). Krishaswamy teaches all the limitations as listed above, however he does not teach each opening having respective rounded over edges adjacent the first and the second surfaces. Fjelstad teaches dielectric laminate wherein comprising a plurality of holes, wherein the edges are smoothly rounded (column 3, lines 54-61). It would have been obvious to one of the ordinary skill in the art during the time the invention was made to have rounded hole edges as taught by Fjelstad, on both side of the dielectric taught by Krishaswamy as to diffuse stress normally concentrated at the hole edges and minimizing "corner crack" (column 3, lines 54-60).

As to claim 35, Krishaswamy discloses the method wherein forming the at least one opening (Figure 5D, element 113) comprises forming a plurality of openings (Figure 5D, first opening through element 111, and second opening through element 103) comprises forming a plurality of openings laterally adjacent portions of the conductive layer with no openings extending through the conductive layer (as shown in Figure 5D, elements 105 and 109 do not have any openings).

Response to Arguments

4. Applicant's arguments filed July 11, 2006 have been fully considered but they are not persuasive.

5. With respect to the applicant's assertion on page 5, second paragraph, wherein the applicant asserts that the Krishaswamy rejects small openings according to column 3 lines 45-53, the examiner again similarly to the previous office action disagrees with

the applicant about this argument. In the paragraph cited by the applicant, Krishaswamy clearly states that this small size refers to the channel rather than the opening i.e. the channel is denoted with numerical 53, while holes or openings are numbered as 113, see figures 4d and 5f respectively. Furthermore the paragraph stating that the small sized channel causes the difficulties in etching, is presented in the background of the invention, and as seen in the first paragraph of the invention summary, the inventor of the prior art does not solve the problem with etching by making big openings, he rather heals this deficiency with uniform structure and multiple openings.

6. With respect to the applicant's argument also on page 5, alleging that Krishaswamy does not teach windows 113 being adjacent to each other, the examiner disagrees with the applicant. According to Encarta Webster Dictionary word "adjacent" means situated near or close to something or each other, this definition perfectly describes the positional arrangement between the openings 113, it is very clear from the figure 5F that those windows or openings are positioned close to one another.

7. With respect to the argument made on page 5, last paragraph contrasting the process of variable, routine experimentation with the very controlled etching process as taught in the prior art, the examiner would like to note that the process or method of producing the structure is irrelevant to the claimed invention, because the limitation argued above is not in the claim, and furthermore the applicant presents the device, not the method, so that only final result, i.e. the structure of the device itself presents clear limitation.

The Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- US Patent 6093330 discloses a microfabrication process for enclosed microstructures comprising conductor, openings and substrate, wherein the etching is performed through the openings.

Inquiry

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela M. Lie whose telephone number is 571-272-8445. The examiner can normally be reached on M-F.

10. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong can be reached on 571-272-1834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Angela M Lie

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